

Autism and Architecture: The Importance of a Gradual Spatial Transition

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The research in the following paper is developed in collaboration with the no-profit organization “Università per i Disturbi dello Spettro Autistico” (UDSA), active on the issue of the role of surrounding environment in the educational process of neuro-atypical young adults. Even though, wide range of population is diagnosed with Autism Spectrum Disorder (ASD), the literature primarily refers to childhood period of neuro-atypical individuals. The study explores how Architecture could help young adults with ASD to become more independent and discover their capabilities reducing environmental obstacles. The Autism Spectrum presents a wide range of cases and hues that does not permit the use of general guidelines for the design process, on the contrary, it requires taking into consideration the variety of attitude toward the surrounding environment. Therefore, the paper interrogates the methodological framework of Architecture to tackle the complexity of the design challenge with a trans-disciplinary approach; a variety of figures, outside architecture discipline, were involved in the research. An adaptive method has been used, based more on Greek idea of metis, the ability to take advantage of circumstances rather than using the Platonic notion of “eidos”, which referred to a determined pattern, to face the multifaceted aspects of the phenomenon.¹ The study resulted in an Architectural project for The University of Autism Spectrum Disorder, in which the strategy of Gradient defines the spaces based on their intensity, activity and frequency. By considering weaknesses and insufficiency that has emerged during the research period, this paper proposes a lucid theory of the design process integrated with contradictory aspects of the spectrum.

Introduction

Even if, the studies on Autism Spectrum Disorder consistently describe the mechanisms and causes of neurodevelopment abnormalities, they still contain a limited source of information on the Architecture’s relevance to the issue and its importance in the everyday life of individuals diagnosed with it.

According to the Centers for Disease Control and Prevention (CDC), in 2014 over 1% of the American population was diagnosed with Autism Spectrum Disorder (1 in 68 children). However, in Europe statistical database is rather scarce, but based on the Department of Health, Social Care of UK it is estimated that more than half a million people in England have autism. This is equivalent to more than 1% of the population. Moreover, as stated by the Autism Spectrum Disorders in the European

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1. Refer to: Alessandro Cravera, *Allenarsi alla Complessità* (Milan: Egea, 2021), 51.

Union (ASDEU) due to limited research on adults, many persons with ASD are not even diagnosed until adulthood, whatsoever environment is not responding to their needs. Through this analysis, it is understood that spatial studies and their performance on neuro-atypical individuals go far beyond minority group necessities.

Even though United Nations adopted the standard rules on the equalization of opportunities for persons with disabilities on 20 December of 1993 (resolution 48/96 Annex),² which represents the moral and political commitment of Governments to take action towards impartiality of educational or career advancement, it still does not speak about individuals with Autism Spectrum Disorder. In fact, according to the survey published by the Office of National Statistics (ONS) at the National Autistic Society of UK on 19 February of 2021, Only 22% of autistic adults are in any kind of employment, which is lower than any previous survey conducted by the association.

According to this analysis, the process of developing abilities and specific talents in the neuro-atypical individuals not only in childhood age is directly connected to their growth towards an independent future. The Architectural research faces design challenges in those processes and aims to identify its role in different stages.

The University's educational project is based on the American college model, for the young individuals after high school and before their orientation in the specific field of specialization. Along with the design research, the proposal in parallel reflects the didactic structure and its adaptive solutions. Explicitly, the organization concentrates on the preparation and integrating of individuals with ASD within society, by strengthening personal talents or abilities after compulsory education. For this reason, the study aims in the following pages to underline the influence and the contribution of Architecture in the improvement and apprehension of Autism Spectrum Disorder.

Due to the opposite poles of the spectrum as hypersensitivity or lack of sensitivity, unidirectional design guideline cannot be applied but rather deepened crucial Architectural criteria. Neither, it can be generalized within inclusive school design accommodations, simplifying Spectrum within special educational needs. In fact, the research project intends to provide a spatial strategy, coherent and adaptive towards given current statistical situation about individuality with ASD in Italy. Moreover, the architectural project refers to the local problematics of the issue.

Literature Review

The literature and informative referential part of the research process has continuously advanced with the contributions of a group of doctors, led by Dr. Marta Stanzani and other representatives from the world of education, public administration and parents, gathered in the non-profit organization UDSA. As

2. UN Global Program on Disability, *Standard Rules on the Equalization of Opportunities for Persons with Disabilities - Target Areas for Equal Participation: Accessibility* (United Nations General Assembly Resolution 48/96, Annex, 1993).

already mentioned, the architectural part follows the educational program carefully developed by the group members, leaving the space for interpretation and contribution from the design process.

At the same time, after overviewing external sources, it has been understood that existing scientific literature regarding Architecture in relation to individuals with ASD (especially when it comes to an adult age individual's environment) rarely considers the wide range of Autism Spectrum; in fact, the majority of the studies regards the relationship between Architecture and the general idea of Autism, with scarce attention towards the hues of cases, which could be very different one from the other.

Nevertheless, some of the theatrical references remain crucial for a deep understanding of the Spectrum and analysis of its most common, until now known effects. Architect Magda Mostafa is one of the names that cannot be left out while speaking about ASD. Apart from the ASPECTSS as a first index of the design guidelines applicable worldwide, like a project development tool, she has published numerous articles about methodology and study cases in the framework of architectural factors or spatial characteristics, such as acoustics, visual (colours and patterns), visual (lighting), texture, olfactory and spatial sequencing of functions.

Likewise, it worth mentioning professor Joan Scott Love with researches done in the framework of a studio teaching experiment³ of Leeds Beckett University, Faculty of Architecture, where the first phase of the research is to analyze the theoretical part of the topic, followed by a comparative method of already existing buildings adapted or designed from the beginning for the neuro-atypical individuals. However, the design laboratory research takes references from the ASPECTSS mentioned previously.

As a summary of theoretical and practical information, a fundamental reference has been the article by Francisco Segado Vázquez and Alejandra Segado Torres - Autism and Architecture published in the scientific community IntechOpen. On the historical background, the article outlines contrasting sides of the Spectrum and tries to define the importance of the Architecture in finding spatial results, however, the research stops on the analytic point of view without offering a specific solution.

On the background of scientific articles, research or informative platforms such as Spectrum, ASDEU, National Autistic Society and Autism Europe has been considered crucial for finding common ground and deepening statistics or educational conditions for individuals with ASD in various countries. What is more, those associations remain key resources for understanding daily opportunities and future perspectives for neuro-atypical individuals in real-time. The news, which is constantly updating, gave the paper the possibility to evolve the project, following up to date information.

However, to understand better what it means to live with ASD in an environment that does not adapt to your needs, external literature has also been a great support. A book that has been published in 2007 with the title "The reason I

3. J. Love, "Sensory Spaces: Sensory Learning – An Experimental Approach to Educating Designers to Design Autism Schools," *Archnet-IJAR, International Journal of Architectural Research* 12, no. 3 (2018): 152-169.

jump: The inner Voice of a Thirteen-Year-Old Boy with Autism”,⁴ written by a young boy Naoki Higashida, has been a fresh view to the ASD awareness.

Such brilliant literature, written by individuals with Autism, become not only a chance of comprehension of the state of mind, difficulties or just various sensibilities, but also a testimony of amazing ability and talent hidden within the people with ASD.

Theoretical Framework and Methods

In order to arrive at a certain methodology, forwardly used and explained in the paper, it is important to understand which theoretical definition of ASD has been taken into consideration. Indeed, up to date, numerous hypothesis has been made towards the disorder, nevertheless, the research chooses the sensory definition of autism, generalized by the researchers such as Rimland, Delacato and Anderson.⁵ The definition results reference as well in Magda Mostafa’s various articles while searching for the design concept and Architecture role for the autistic users: “In such theories, autistic behavior is credited to a form of sensory malfunction when assimilating stimulatory information from the surrounding physical environment.”⁶

Mostly the output of similar study topics are guidelines and prescriptive notes. Those results highlight the intention to connect peculiar behaviours with spatial conditions. This methodological approach could be extremely effective with other disorders, but it is insufficient to establish a general rule in the case of the wide range of ASD. It is for this reason that it is important to understand that nor research neither project methodology can give an audience to the typical perception as the spatial understanding. Indeed, awareness of contrasting attitudes regarding surroundings plays a key role in the method’s definition.

This complexity requires the use of a new attitude to deal with the subject, derived partially from the new developments of the physical, chemical, biological, social sciences. In this field, the reality is based on a complex system, in which it is necessary to conceive the subject, no longer as a juxtaposition or a sum of parts, but through a new paradigm: an inclusive system of links, diversity, transversality and adaptation. Thus, the specific element of a theory is no longer the reduction from complexity to simplicity, but that of translating complexity into a theory or rather into a “differential sequence of theoretical approximations”.⁷

4. N. Higashida, *The Reason I Jump: The Inner Voice of a Thirteen-Year-Old Boy with Autism* (Great Britain: Hodder & Stoughton, 2013).

5. B. Rimland, *Infantile Autism: The Syndrome and its Implications for a Neural Theory of Behavior* (New York, USA: Appleton Century, Crofts, 1964); C. H. Delacato, *The Ultimate Stranger - The Autistic Child, Academic Therapy Publications* (California, USA: Novato, 1974); J. M. Anderson, *Sensory Motor Issues in Autism, Therapy Skill Builders* (Texas, USA: The Psychological Corporation, 1998).

6. M. Mostafa, “An Architecture for Autism: Concepts of Design Interventions for the Autistic User,” *Archnet-IJAR, International Journal of Architectural Research* 2, no. 1 (2008): 189-211.

7. M. Ceruti, and F. Bellusci, *Abitare la Complessità* (Milan-Udine: Mimesis, 2020), 51.

The impossibility to define a univocal solution for a safe environment leads to elaborate an open method to be applied in the design process. The variety of alterations in the perception of the ASD suggests the definition of a system of different possibilities in a clear order, rather than a precise set of strict rules. In this sense, the attention for the quality in the sequence of spaces has a universal validity in designing. The abandon of effect-cause relation between information reflects a general attitude in which the possible relations in a variety of situations are fundamental (see Figure 1).

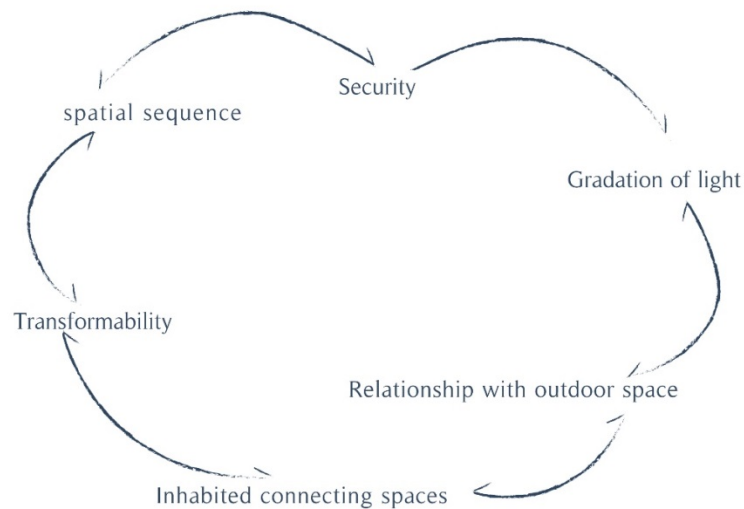


Figure 1. *Key Element Concept*

Source: Duccio Fantoni, Salome Katamadze, Alessandro Gaiani, 2020.

On the background of this complexity, the research is based on the involvement of experts from other sectors, who no longer just become participants, but also co-authors/producers in the design process through a trans-disciplinary approach to recompose a coherent dialogue between different fields of knowledge. In the study, Architecture, Medicine and Sociology could not run in parallel, on the contrary, they should intertwine in continuous reciprocity of intersections. The impossibility to marginalize complexity in different autonomous elements is leading towards recollecting solutions from the different fields and applying them in the practice altogether. Such a multidirectional interweaving authorizes a transition from memory to contemporaneity, from the object to the act, from a condition of marginality and exclusion to one of inclusion, feeding that incredible interweaving that is the architectural project. This attitude implies a continuous adaptation and mediation of the project to the contingent conditions in continuous mutation.

In order to respond fully to the ever-changing metabolic manifestations of young adults with ASD and to define the quality of such an educational facility, the project has required a change in the approach to the method. The method moves from a Cartesian scientific paradigm, which proceeds by simplification¹ in which the elements are broken down, reduced and ordered, commonly used for architecture, to a complex one, more appropriate to the subject matter.

The approach is not the one used in the analyzed scientific literatures, based on the scientific system, as it is considered no longer appropriate for discovering the multi intelligibility linked to buildings for the education of these individuals. However, autism, by its nature, presents in enlarged forms and, therefore, the Cartesian disjunctive logic, which separates and decontextualizes, it results insufficient.

Furthermore, the survey of the scientific literature reveals that most of the projects tend to focus on the younger generation and their learning processes up to school age, abandoning the training of individuals with ASD in the post-school age.

The chosen method and its result focus precisely on the design of a building for the after-school education of young people with ASD.

The multitude of ways in which autism manifests itself leads to use a method that seeks to “weave”, to put together, parts connected by variable relationships, and that uses adaptive tools capable of relating to the diversity and complexity of the cases.

Referring to Von Foerster’s exposition, the chosen method involves action, translated into interaction with experts and parents who deal with the problem by conducting interviews and then making use of direct experiences. This first approach allows to formulate an assessment of the situation's potential; afterwards moving on to learning, translating the data through a simple but adaptive strategy; to conclude with an adaptation that is expressed in the proposal of different configurations that has being changed by interacting and relating with the figures previously mentioned.⁸

The action phase is concluded by jointly determining an element that, even in the different manifestations of the disorder, certainly has an impact: the perception of objects, spaces and people with particular attention to light.

During this phase, some question has raised: how can a compound element such as light be separated, and faced only in terms of psychology, environmental performance, pedagogy and physiology? To overcome this impasse, Architecture offers the opportunity to gather all the points of view in a fragmented, yet holistic, theory of the project, in which disciplines define the terms of a relationship between different aspects and Architectural elements.

Therefore, the focus is on all those spatial relationships that play with light and perception in general: the connection between inside and outside, the degree of inclusiveness and the smooth transition between shared and individual areas.

The ongoing researches about Autism and Space focus on specific aspects of perception.

8. Refer to: Cravera, *Allenarsi alla Complessità*, 2021, 51.

It then becomes essential to define a consideration of necessity that is implicitly identified in the relationship between theoretical thought and design in architecture.

It is worth mentioning as an exception in the modernism the position of Alvar Aalto, especially after the conference “Rationalism and Man” held at the Swedish Craft society in Stockholm in 1935. The Finnish Architect ascertains the impossibility to deal with human perception of space within the paradigm of a narrow scientific and diagrammatic approach. Those limits were evident in the control of lightings factors, fundamental issues in projects as Viipuri Library and Paimio Sanatorium. The problem of light, natural or artificial, is a starting point for considerations about the complexity of the aspects that compose the space. In fact, this attitude interests a wide range of elements, from the acoustic relevance of the ceiling to the touch of the doorknob, beyond the idea of standard and scientific prescription.

Aalto introduced the discipline of Psychology into the Architectural discourse, in combination with a careful understanding of the role of tradition, for a more human orientated approach. Although the necessity of a wider perspective on the relational importance of the project is not defined in a clear transdisciplinary framework, Aalto proposed an attempt to overcome the impasse of mere cause effect methodology in the debate on human perception of space. It mostly becomes evident during and after the project of a Sanatorium and a Library. The presence of different users in specific conditions required solutions that could not be determined by the rationalist-typological repertoire. The criterion of rational simplification was largely insufficient to comprehend all the level of complexity that involved education and health. This paradigm shift is an essential hue to elaborate a new approach in the case of Autism Spectrum Disorder.

The range of possible behaviours of ASD persons in respect of any condition is so wide that a precise strategy has been elaborated to overcome this impasse. Therefore, the idea of designing spaces with different perceptions and relationships is at the basis of the project and has been expressed through the strategy of Gradient (see Figure 2) that articulates the architectural space gradually based on the intensity of relationship with the others, in terms of potency, activity and frequency.

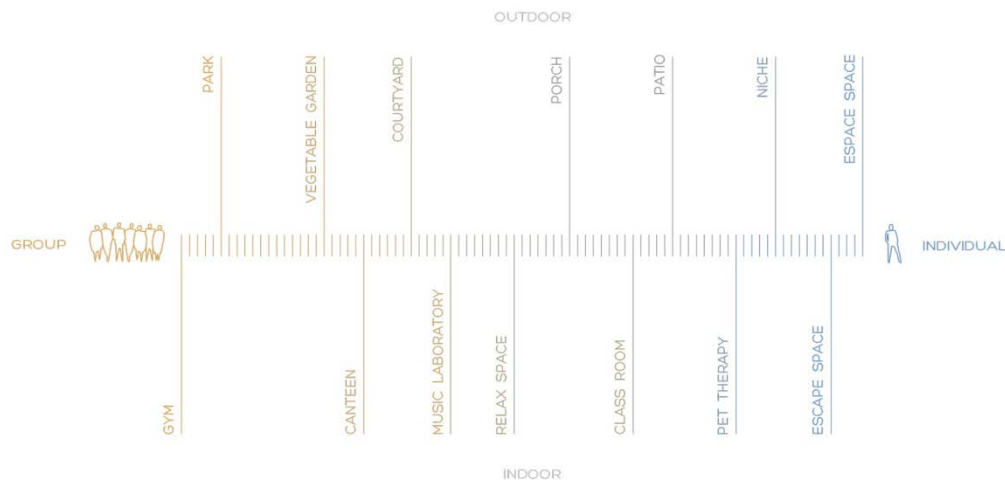


Figure 2. Gradient Strategy Diagram to Illustrate the Transition from Individual to Group Spaces, in Outdoor and Indoor Conditions

Source: Duccio Fantoni, Salome Katamadze, Alessandro Gaiani, 2020.

The presence of a variety of conditions stimulates every individual to find his/her own environment. At the same time, the sequence of spaces with different sensorial conditions avoids the risk of “the golden cage”, the situation in which the comfort is so high that any variation becomes a trauma. Therefore, the safe and balanced environment is not an a-priori, but it relates to the specificity of the persons to stimulate the aptitude to adapt to uncontrolled situations.

In this sense, Architecture is the most influential factor: beyond prescriptive guidelines, the willful arrangements of situations in a coherent frame are the decisive starting point; the importance of transition prevails over the definition of generic spatial solutions to offer a variety of conditions with different intensity of stimuli.

The parameters of intensity are related to the most significant source of discomfort for ASD persons in relation to all the senses. Crowding is a crucial factor: the chance to meet other persons, especially strangers, is a high-intensity factor. Furthermore, the presence of disturbances is related to the proximity to dynamic situations (like a corridor or a playground). The mediation of the conditions is more important rather the removal of the sources. Architectural solutions guide the ASD persons to the most suitable place for his/her peculiar inclination (see Figure 3).

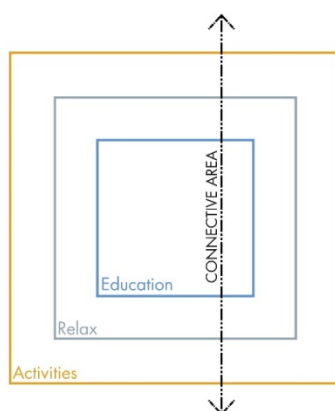


Figure 3. *The Strategy of Rethinking Relation between given Activities and Connective Area*

Source: Duccio Fantoni, Salome Katamadze, Alessandro Gaiani, 2020.

These interferences relate to the exchange between users, as living beings, and architecture, as a still object, in a degree of ductility of space “An architectural space must appear, but it must also have the capacity to disappear quickly. The issue of appearance, which is more important than the issue of disappearance, does not have to do with temporary structures, but rather with a gradient of deformability in the interaction between living and non-living bodies.”⁹

The proposed method reflects in a continuous exchange between knowledge belonging to the world of medicine and education and that of architecture.

This transdisciplinary relational intertwining, has defined an instrumentation in accordance¹⁰ with the expressive identity of each group.

The learning project for neuro-atypical persons requires a reinterpretation through the use of new tools suited to complexity, which, like catalytic agents, trigger reactions. These Tools, in their constitutive identity, contribute to change and to reformulate the co-production of conditions of reciprocity with people, in which architecture takes on an evolutionary dimension. In this regard, it has been an interesting reference the famous essay by S. Freud *Analysis Terminable and Interminable*, 1937, in which the author suggests different activities “It almost looks as if analysis were the third of those impossible professions in which one

9. O. Carpenzano, *Qualcosa sull'architettura. Figure e Pensieri nella Composizione* (Macerata: Quodlibet, 2018).

10. J.-H. Martin (Ed.), *Partages d'exotisme* (Lion: Réunion des Musées Nationaux, 2000), 124.

can be sure beforehand of achieving unsatisfying results. The other two, which have been known much longer, are education and government.”¹¹

The analogy among impossible, therefore interminable, professions reflects the instability of the process related, although differently, to individual behaviors. For these reasons, the activities appear appropriate to define a range of actions that could shape the space: government refers to the act of indicating a general order in which variations, dictated by behavior that cannot be determined, could coherently combine. Education represents the backbone of the project and it expresses the possibility to lead the individual to express specific potentialities. The analysis, out of the framework of Freudian theory, reflects the mission of better understanding behaviors to help to improve life quality, not just for a specific individual, but for a wider range of cases.

The result is a new and changed form, not only the outcome of a creative act but the adaptive result of a multi-relational processual interweaving that originated and shaped it.

Results

The project of a University for ASD persons (UDSA in the Italian acronym) aims to support a sustainable integration within the society. In fact, the differences in perception are not necessarily limits to an autonomous life. The mission of the UDSA is to support the talents in the neuro-atypical persons and to support them in future adult life. The suggested research design methodology seeks as a result an Architectural proposal.

In order to understand the Gradient strategy, it is important to follow in the narration step by step the same sequence that was translated from the theoretical ideas to the Architectural project. In fact, for further deepening of the proposed design, the research prefers to describe the project through three main sectors, starting from the low stimulus arriving at the highest one: The west block of the building that resembles an autonomous academic system capable of functioning without any additional extensions, the middle block, which represents the pivotal point of the University, as it consists of an Atrium with double high, farther followed by refectory and access to the offices on the second floor, and last but not least, the east block a culmination of the building – the gym which symbolizes activity, exchange and the most crowded area.

Each sector contains different elements, that at several points intersect with each other, however tending to maintain the main characteristics of the “Gradient” strategy through the whole building (see Figure 4).

11. S. Freud, *Analysis Terminable and Interminable* (London: Hogarth, 1937), 248.

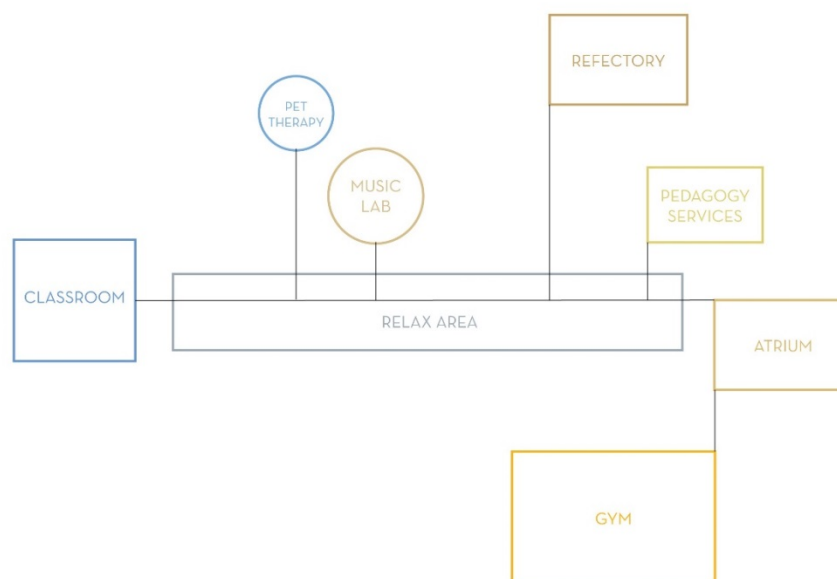


Figure 4. *The Gradient Strategy Following the Whole Building Program*

Source: Duccio Fantoni, Salome Katamadze, Alessandro Gaiani, 2020.

The West Block

As already mentioned, the west block of the building serves mainly for didactic purpose. It is being estimated that each year university would host approximately 40/35 students, while the studies would last for consecutive 3 years, in consequence, the building should host from 100 to 110 students in total. Therefore, there were designed 6 classrooms with additional, variable and flexible spaces.

The Courtyard

The main figure of the West Block is the central internal courtyard, which defines and guarantees a circular, continuous flow inside the building. Nonetheless, the outdoor spaces have their own definition of the 'Gradient' strategy, they still remain in tight relation with the indoor environment and mostly follow the sequence of the activity. Indeed, the courtyard represents the heart of the educational spatial system, where students from different classes can meet, socialize and have a direct connection with the external environment, while maintaining the aspect of safety and measurability of the area (see Figure 5). The rhythmical design pattern (being repetitive in the use of some elements, but within a certain distance introducing a change or a new element) helps to create recognizable features of the garden, where each person can find mutual or individual space without being excluded based on their particular perception or sensibilities.



Figure 5. *Perspective of the Inner Courtyard, in the Didactic Area of the University*
Note: The connective spaces and the pet therapy laboratory are directly connected with the outdoor area.

Source: Duccio Fantoni, Salome Katamadze, Alessandro Gaiani, 2020.

It remains important to underline, that the design attitude has never divided the strategical approach from the architectural idea. In fact, the variability of the courtyard's inner space results from the structural pitch, that at the same time generated individual spots in case of the necessity. As recommended from the educational program, the garden has a connection to the pet therapy area, which represents another variation of the outdoor facility where the students have a possibility of interaction with different domestic animals.

Connection

In the several research and guideline papers, one of the most problematic part in spatial terms are the passageways, corridors or distributive areas inside the building. Monotonous, repetitive and indistinguishable hallways often cause disorientation and, what is most effortful, a shocking effect of drastic change from one type of environment to another. As a matter of fact, this was one of the aspects, which the design process aims to resolve, still maintaining the central system of the garden.

The natural light to be direct but seamless all over the route. Transparent elements between these two spaces guarantee an equal exchange of the perception, avoiding alienating feelings for inner or outdoor spaces. The connective area is following the same rhythmical approach already mentioned above, but this time the diversity

of the space is caused not only by the singular structural elements but also by the shifting volumetric position of the classrooms. Moreover, along the way, the passage is equipped with small niches or particular playful furniture to give to students the opportunity for a moment alone or just an observation point of view from where one calmly adapts to the environment (see Figure 6).



Figure 6. *Connective Spaces*

Note: The connective spaces permit many activities. Their generosity allows both social interactions and peaceful isolation, in regard to the psychophysical condition of the students.

Source: Duccio Fantoni, Salome Katamadze, Alessandro Gaiani, 2020.

Classrooms

As already specified, in the university, there are 6 classrooms explicitly dedicated to the didactic program, which should host not more than 20 students per lecture. However, based on the didactic program, classroom organization does not follow the traditional method but try to adapt to the sensibilities of the students. For example, each person can attend the lecture in a form she/he would prefer, sitting or standing, as the maximum time of each lesson would be only 30 minutes (this time quantity is considered adequate for fully maintaining one's attention and concentration).

In the design proposal, apart from offering easily transformative and adaptive spaces for the classrooms, it was crucial to elaborate a certain module, which would contain relation with the supplement areas, such as relax rooms and small outdoor spaces. Indeed, the project offers a combination of the program where two classrooms share one garden, for didactic activities and direct contact with the

natural environment even inside the classrooms, and one relaxing room, equipped and dedicated to calming moments or even socializing possibilities (see Figure 7).

Such a quantity of spaces allows to avoid crowded and overstimulated atmospheres during the learning process. It must be mentioned that within the classrooms there were designed also an individual area, to take a short pause from the ongoing lecture, and an individual bathroom.

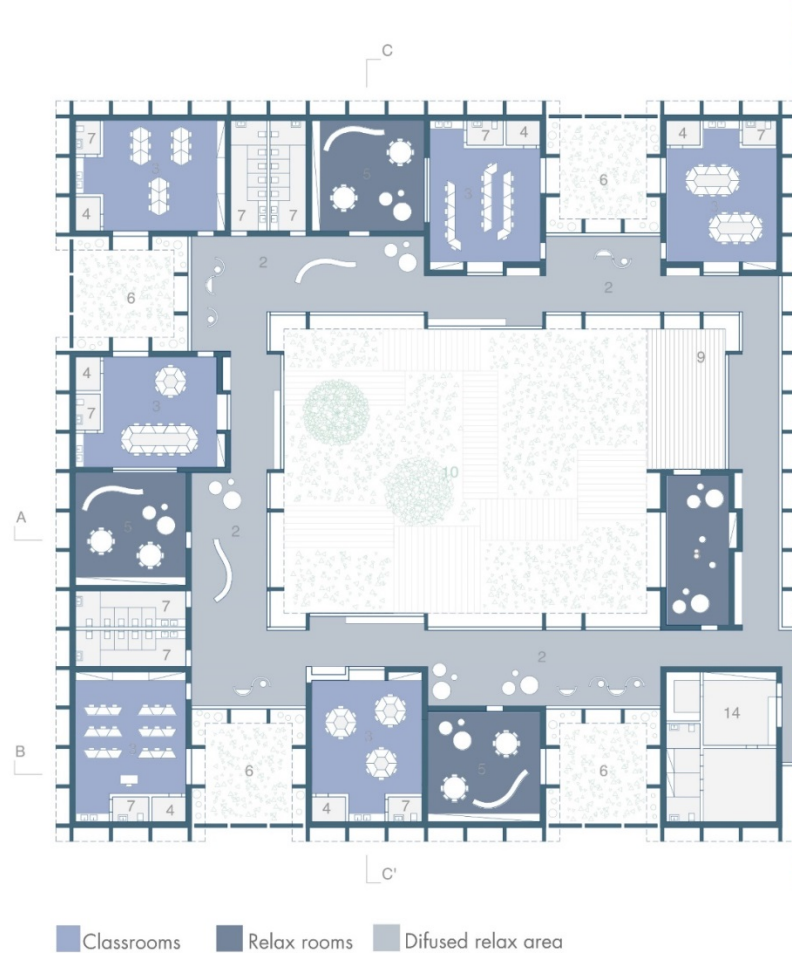


Figure 7. Schematical Plan of Classrooms, Relax Rooms and Diffused Relax Area in the West Block of the Building

Source: Duccio Fantoni, Salome Katamadze, Alessandro Gaiani, 2020.

Beside the program and relational aspects between different areas, one of the fundamental design elements remained the light and acoustic performances. These two components is a primary problem that creates barriers in the perception or concentration for the individuals with ASD. Therefore, there were introduced vertical glass elements, starting from above of the eye level, which would guarantee to filter not only the direct light but also the information and distraction from the street view.

The Middle Block

The middle block of the university represents the open and welcoming space of the building, its setback position compared to the rest of the southern façade, internal structure and playful blue panel variation helps to differentiate from the rest of the volume and indicate the main entrance (see Figure 8). To avoid a drastic change from outdoor to indoor space, another courtyard is present, as an architectural void and filter. The proximity between the entrance area and inner garden allows a soft transition from the outside world to a new environment.



Figure 8. *Perspective of the South Elevation*

Note: The facade expresses the repetition of the structure and the gradual raising of the curved roof.
Source: Duccio Fantoni, Salome Katamadze, Alessandro Gaiani, 2020.

Connections

Through the design process, the atrium has gained different variation of uses, based on the architectural decisions of leaving the space as free as possible, maintaining certain emptiness that in the case of necessity could accommodate any kind of event or need. In the everyday life rhythm, it represents the main connecting area inside the intervention, some kind of a buffer zone between the academic and leisure part of the volume.

Moreover, the atrium takes advantage of the height generated by the curved roof (external point starting from the classrooms, of 5 meters and arriving approximately at 15 meters on the other side of the gym) to provide an ample perception of the space (see Figure 9). Apart from being a connective area between the classrooms, canteen, offices and the gym, occasionally in wintertime it becomes a small indoor theatre facility, while in the summer it can incorporate the outdoor part of the garden for the participants and become a stage itself.

Refectory and Offices

The refectory, which is facing the inner courtyard for more natural light and privacy, is not only a place to get a meal but represents one of the spaces of socialization, exchange and even participation, through an engagement of the students in the cooking process. Due to the high number of students, the area of the canteen is quite spacious. However, confusion, noises and spontaneous activities are typical for these environments. Therefore, it has been very important to find an architectural solution to avoid a chaotic atmosphere.



Figure 9. *Longitudinal Section of the Intervention*

Note: The project combines outdoor spaces of different size and atmosphere.

Source: Duccio Fantoni, Salome Katamadze, Alessandro Gaiani, 2020.

The project offers a smaller sector division of the voluminous refectory through different height partition panels, which guarantee noise absorption allowing individuals with ASD to have an opportunity of concentration and effortless interaction with the ambient and between each other.

The university for individuals with Autism Spectrum Disorder is not only a place of education but as well deepening research of the disorder towards improvement and progress.

The students while attending university can also contribute, make changes and offer new ideas for a better understanding of their needs. The project included as well part of the offices and archives where these studies and observation could develop by the students, teachers and psychologists of the school.

As before, the design proposal organizes research spaces on the second floor, above the refectory, taking advantage of the transparent glass façade facing in the inner garden for natural daylight and visual connection with the rest of the building.

The East Block

The east block of the volume is where the curve of the roof arrives at the highest point and resembles the most active space through the university. As the studies show, physical activity takes a great part in the improvement and stabilization of the disorder, while often individuals with ASD suffer from motor and coordination difficulties.

The project contains a professional basketball stadium equipped with separate changing rooms for students, services and stands for possible open events. Besides the stadium, the gym offers a smaller activity area with various exercising equipment on the mezzanine floor. Because of the sophisticated level of the university's activity part, it even can be used by the city during the closing hours of the school. Like in the other sides of the building, the gym gets soft daylight from the upper openings which make spaces even more adequate for individuals with ASD.

In the project, any spaces could be portrayed based on perceptive qualities. The common spaces, such as the gym, the canteen and the entrance, represent environments with high intensity of stimuli (see Figure 10). On the contrary small niches or the benches in the recesses, represent a decompression spot for the need of pause from the information.

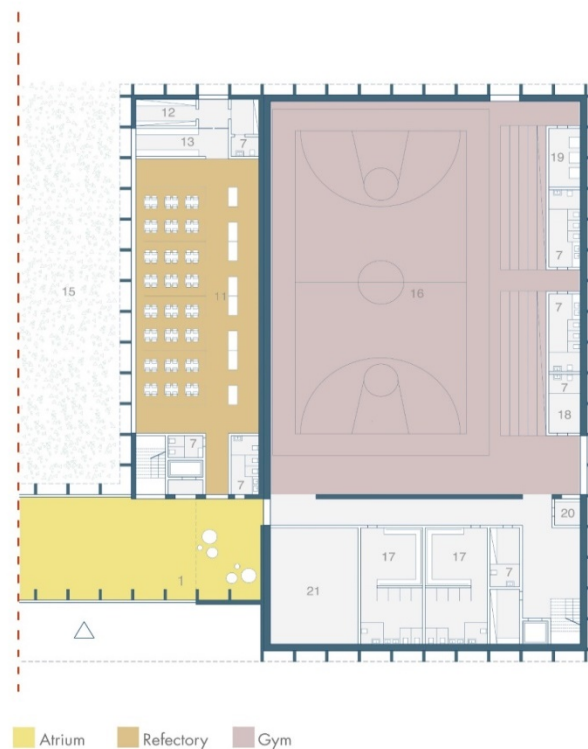


Figure 10. *The Middle and East Block Plan with High Stimulus Program*

Source: Duccio Fantoni, Salome Katamadze, Alessandro Gaiani, 2020.

Therefore, the program itself is articulated on a sequence of spaces with a gradient stimuli intensity, scattered of safe havens in case of necessity. Within the same logic, the control of the sun rays permits to distinguish different rooms not just in term of lighting comfort, atmosphere and brightness, but also to mediate the contact with the outside. The windows higher than the human eye define introverted

spaces, with fewer external details; on the contrary, the windows on the small patios encourage to interact with the outside environment, in a safe condition.

In parallel, the same division of the intervention is possible with outdoor places: the grade of connection with the outside world, the extension and size, the presence of covering and the number of entrances/exits (see Figure 11).



Figure 11. Overall View of the Project Plan

Note: The three sectors are visible in the layout: the didactic area, the public central space, the gym.

Source: Duccio Fantoni, Salome Katamadze, Alessandro Gaiani, 2020.

The division in three blocks or sectors responds to a gradient sequence of stimuli intensity and permits a delicate transition to the building. Every sector presents a different logic: the gym is a compact element, the central core is a porous and transparent connection, the didactic area is an introverted volume that encloses a courtyard garden. The continuity of the curved roof allows understanding the project as a unity, especially to orientate the students (see Figure 12).



Figure 12. *Perspective from the North Side*

Note: The intervention guarantees a high level of privacy and it uses the surrounding areas as an open field for free activities.

Source: Duccio Fantoni, Salome Katamadze, Alessandro Gaiani, 2020.

Conclusion

In conclusion, the delicate premises revealed the opportunity to generate a new aptitude in the relationship between Architecture and individuals.

The limits and directions of previous studies have nurtured the curiosity to experiment with a new methodological approach, which is not intended to be definitive, but a point of departure for further developments, ready to be improved and integrated with updating information and future development of the issue.

It needs to be remarked the fact that the necessity to adapt to specific conditions of Autism led to a method, that could be valid for architectural projects in different contexts. The design strategy reflects the importance to express the numerous relations in a specific architectural intervention. In this sense, the role of the project is not more to impose a state of things, rather to allows interactions to take place in the space. This shift is condensed in the proposal for University for Autism Spectrum Disorder in Architectural and educational terms. The Gradient strategy combines several necessities in a precise, yet open, configuration. This form of complex reciprocities requires the Architecture to maintain its quality in a continuous state of adaptation. In fact, the goal of the project is to guarantee such a variety of situations to allow any neuro-atypical adult to achieve a desirable state of concentration. In this process, the idea of homogeneity is questioned in the

balance between the individuals and the group. Therefore, the physical space represents a sensitive place of negotiation.

The criterion of the Gradient suggests a connection of permanent conditions, proper of architectural presence, and transitory activities. This relation expresses the preeminence of qualitative aspects over standard requirements not only for neuro-atypical users but also in neuro-typical ones.

The proposal suggests an Architecture aptitude that includes differences and nuances, instead of omitting them.

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